

axonal loss in peripheral nerves. In the late distal sensory neuropathy of HIV infection also, CMV infection in various organs has been reported along with the finding of CMV in the dorsal root ganglion of a single case.⁴

The exact role of vitamin deficiency and environmental toxins, particularly on the late distal sensory neuropathy of HIV infection, is unknown. There has been one report of a significant abnormality of vitamin B₁₂ metabolism in patients with HIV infection and neuropathy.⁵ It is, of course, distinctly possible that a subclinical neuropathy in HIV-infected patients becomes symptomatic when a patient is exposed to minor amounts of environmental toxins or minor degrees of deficiency that are harmless to healthy persons.

Many interesting theoretical and practical questions relevant to the dysfunction of the neuromuscular system in HIV infection remain to be resolved. What is the relationship of the early neuromuscular complications to the early effects of the virus on the immune system? These effects are activation of the immune system as evidenced by markers on T cells and increased serum levels of β_2 -macroglobulin. High levels of these "activation markers" have been associated with an increased risk of what has been called "short-term progression" of clinical HIV disease. It would be of interest to know if there is also association with the development of one or more of the neuromuscular complications. Also of interest is the question whether infection by different strains of the HIV virus carry different risks to the central or peripheral nervous system and whether there is any relation to the other immunologic features of HIV infection, for example, hyperglobulinemia.

Finally, many questions remain as to the appropriate treatment of these neuromuscular syndromes. One of the most interesting is the question of the prevalence of CMV infection requiring treatment. The results of the treatment of polyradiculopathy with ganciclovir are in many patients, as pointed out by Miller and others, impressive.⁶ Because CMV is so prevalent in HIV-infected persons and because the antigen has been found in peripheral nerves, should the treatment be tried in all patients with late peripheral nerve complications of HIV infection?

Because HIV antigen has been found in peripheral nerve in some of these patients, are there patients in whom the neuropathy might be reversed by treating the HIV infection? The answers to these questions may soon be forthcoming.

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Vegetarian Diets—Clearing the Air

A 1992 SURVEY conducted by the market research firm Yankelovich, Clancy, and Shulman and commissioned by *Vegetarian Times* magazine showed that almost 7% of the American public, or about 12.4 million people, consider themselves vegetarians. Previous estimates of the prevalence of vegetarianism in the United States gave a number closer to 4% of the population.

Closer inspection of the Yankelovich figure reveals that of the 7% of those surveyed who called themselves vegetarians, most of them actually ate meat sometimes, although they usually avoided red meat. A better term for these respondents might be "meat restricters." The majority cited health concerns as the reason for adopting a mostly vegetarian diet.

It is heartening to learn that at least a portion of the American public is motivated to assume an active role in managing its own health care by taking preventive measures, such as adopting a more plant-based diet. Given that vegetarian diets are associated with decreased mortality from most of the chronic, degenerative diseases and conditions that afflict westerners,¹ this trend toward a healthier diet should be supported and encouraged by health care professionals, particularly the primary care physicians with whom patients place the most trust in guiding their health care decisions.

Vegetarians have lower rates of coronary artery disease, hypertension, non-insulin-dependent diabetes mellitus, some forms of cancer, and obesity than do nonvegetarians.¹ Vegetarians may also have fewer kidney stones and gallstones. Although lifestyle factors other than diet may have some bearing on health benefits, the vegetarian diet itself is likely a major factor. Plant-based diets are lower in total fat, saturated fat, and cholesterol than nonvegetarian diets, and they are higher in the protective substances found in plant matter, such as fiber and antioxidant nutrients. In fact, it is much easier to meet the dietary guidelines for Americans on a vegetarian diet than on a nonvegetarian diet.

Well-planned vegetarian diets easily meet nutritional requirements and dietary recommendations without providing the excess fat and cholesterol that characterize the traditional US nonvegetarian diet. Even so, many health professionals still have questions about some of the nutrients that we all learned to associate with animal sources. Most common among these are questions about protein, iron, calcium, vitamin B₁₂, vitamin D, and zinc.

Myths concerning protein needs and vegetarian diets prevail, although protein needs are the nutritional issue for which there is probably the least reason for concern. The fact is that all essential and nonessential amino acids can be supplied by plant sources alone, assuming that a

reasonable variety of foods is consumed and that calorie intake is adequate to meet energy needs. Assuming that these two criteria are met, it would actually be difficult to plan a protein-deficient diet. There is also no need for a conscious combining of foods within a given meal to form a "complete" protein, as the outmoded complementary protein theory suggested was necessary.

Concerns about iron nutriture center around the idea that animal (heme) sources of dietary iron are absorbed more easily than are plant (nonheme) sources of dietary iron. Some well-known inhibitors of dietary iron absorption are present in plant-based foods, such as phytates in grains or tannic acid in tea. (Dietary fiber does not bind with iron, as was once widely thought.)

Plant foods, however, also contain enhancers of dietary iron absorption, such as the ascorbic acid found in fruits and vegetables. Within the context of the total diet, these inhibitors and enhancers of iron absorption generally offset each other. In reality, vegetarians are no more prone to iron deficiency than are nonvegetarians.¹ An exception is some populations of vegetarians in developing countries who consume diets that are heavily grain-based with little access to vitamin C-rich produce and who, in some cases, drink copious amounts of tea. Western vegetarians, however, typically have good iron status.

Some substances found in plants also appear to inhibit the absorption of dietary calcium. Once again, however, within the context of the total diet this effect is apparently insignificant. Calcium deficiency in vegetarians is rare, and even when calcium intakes are below the recommended dietary allowance,² there does not appear to be an adverse health effect in vegetarians.

Vegetarians absorb and retain calcium better than do nonvegetarians. In fact, US calcium recommendations are considerably higher than those for populations that consume a more plant-based diet. The increased US calcium recommendations are designed to compensate for the calciuric effect of the high levels of animal protein intake that are customary in this country. Thus, while vegetarians generally consume adequate amounts of protein, they do tend to moderate their protein intake, resulting in more efficient calcium absorption.

Zinc is a trace mineral that is receiving more attention recently in the nutrition literature as its role in human growth and development is explored. Western vegetarians typically have satisfactory zinc status, however. Good plant sources of zinc include grains, nuts, and legumes.

Vitamin D is routinely added to the milk supply in the United States. Therefore, anyone who consumes dairy products is receiving a vitamin D supplement. Vitamin D is produced on the skin's exposure to sunlight and is stored by the body. Most people can get all of the vitamin D they need from regular exposure to sunlight. For those who consume no dairy products and who, for whatever

reason, do not receive regular exposure to sunlight, an over-the-counter vitamin D supplement of no more than 100% of the recommended dietary allowance for vitamin D can be taken.

Granted, any dietary pattern—vegetarian or nonvegetarian—has the potential to be healthful or hazardous, depending on how much attention is paid to basic principles of nutrition. But reasonably planned vegetarian diets are appropriate for people of all ages and are associated with certain health advantages. Therefore, physicians and other health care providers should be educated about the health and nutritional aspects of vegetarian diets and be ready to support patients who express an interest in this dietary alternative. For this reason, the article by Randall White, MD, and Erica Frank, MD, MPH, elsewhere in this issue of the journal³ is a valuable addition to the medical literature.

Planning vegetarian meals is simple. An excellent consumer education pamphlet, *Eating Well—The Vegetarian Way*, is available from the American Dietetic Association in bulk or in single copies. This 12-page brochure includes practical tips for planning vegetarian diets, an explanation of nutrition issues, a meal plan, and a sample menu. The meal plan starts with the vegan, or strictly vegetarian, diet as the "least common denominator" and can be adjusted to include some animal products as desired. Contact the American Dietetic Association at (312) 899-0040, or write to 216 West Jackson Blvd, Suite 800, Chicago, Illinois 60606-6995.

In summary, patients who initiate a discussion of vegetarian diets as a dietary alternative should be encouraged by their physicians and other health care providers to make this lifestyle change and supported by referrals to sources of good-quality reliable educational materials. Furthermore, physicians and other health care professionals should be aware of the potential health benefits of vegetarian diets and the relative lack of risk associated with appropriately planned vegetarian diets and offer this alternative as an option to their patients, particularly those who are at high risk for coronary artery disease.

Not everyone will be interested in making the switch to a vegetarian lifestyle. But everyone deserves to have the choice. If the choice is to adopt a more plant-based diet, then health care providers should encourage and support that decision.

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